REMARKS

Non-elected claims 11-15 have been canceled. Applicants reserve the right to file a divisional application directed to the cancelled subject matter. Claims 1 and 6 have been amended to incorporation therein the recitation of claims 2 and 7, respectively. Claims 2 and 7 have been canceled.

Review and reconsideration on the merits are requested.

Claims 1-10 were rejected under 35 U.S.C. § 103(a) as being unpatentable over EP 1066 818 A1 (EP '818). EP '818 was cited as disclosing the preparation and use of optically coherent multilayered film coated powders, including a base and at least two coated layers having refractive indices differing from one another.

Although acknowledging that EP '818 does not specifically disclose the claimed equations, the Examiner considered that it would have been obvious to optimize and conform the parameters and properties of the powders of EP '818 to the claimed equations.

Applicants traverse, and respectfully request the Examiner to reconsider for the following reasons.

The claims under examination are directed not to a product, but rather to a process for designing an optically coherent multilayer film-coated powder. The claimed process includes specific manipulative steps, including measuring a spectral intensity curve of the intended color, and obtaining substances and thicknesses of the coated layers and an order of formation of the layers that (i) provide optically coherent multilayered film-coated powder having certain values in a CIELAB color system of the intended color that minimize a color difference ΔZ^* expressed by equation (3), and (ii) which make a hue ratio expressed by equation (4) within a range of from

0.9 to 1.1. As claimed in claim 5, the process is carried out by simulation using a computer. Independent claim 6 is similar to claim 1, but is directed to a process for producing optically coherent multilayered film-coated powder.

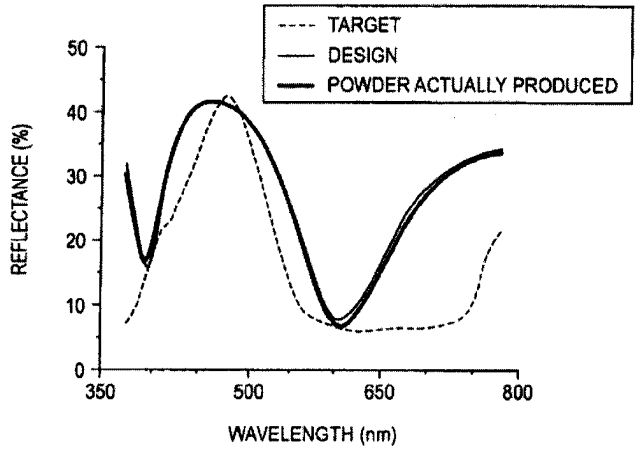
Turning to the cited prior art, EP '818 relates to an inorganic composite powder comprising two or more types of inorganic oxides having different refractive indexes respectively and sequentially laminated from the one with the highest refractive index at the bottom on a scaled substrate, where the difference in refractive index between the outermost layer and adjoining inner layer is 0.6 or below (claim 1). The inorganic oxide is selected based on the covering capability required for the inorganic composite powder to be laminated therewith. Paragraph [0018]. The second and higher layers are formed for lamination, and to suppress reflection of light and obtain the feeling of transparency. Paragraph [0019]. If the difference in refractive index between two adjoining layers is not less than 0.6, a configuration is allowable on the condition that the thickness of one of the second and higher layers is within ±20% of the value d calculated through the equation set forth in paragraph [0021].

As noted above, the present claims relate to a process for designing a multilayered-film coated powder having a desired color. Even if EP '818 is assumed to disclose selection of a base particle and an intended color, EP '818 does not disclose the step of measuring the spectral intensity curve in values L^*_0, a^*_0 and b^*_0 in a CIELAB color system of the intended color as required by present claim 1. Moreover, EP '818 does not disclose the step of obtaining substances and thicknesses of the coated layer in an order of formation of the layers that minimize a color difference (color difference (ΔZ^*) expressed by Equation (3) and which make a hue ratio expressed by Equation (4), among other requirements, as required by present claim 1. The powder actually produced overlaying the target and design is shown in Fig. 1 of the

The powder actually produced overlaying the target and design is shown in Fig. 1 of the specification.

Because EP '818 fails to disclose or suggest one or more of the claimed method steps, EP '818 does not render the present claims obvious. Also, this is not a matter of discovering an optimum or workable range. Rather, the present invention is directed to a process including specific manipulative steps not disclosed by the prior art such that the Office Action does not establish a *prima facie* case of obviousness. MPEP § 2143.03.

FIG. 1



Applicants respectfully disagree with the Examiner's assertion that the design steps as set forth in the present claims amount to no more than discovering an optimum or workable range involving only routine skill in the art. Particularly, pursuant to MPEP § 2144.05, a particular parameter must first be recognized as a result-effective variable *before the determination of the optimum or workable ranges of a variable might be characterized as routine experimentation.* Regarding this last point, there is nothing in EP '818 or the prior art which teaches that

minimizing the color difference (ΔZ*) expressed by Equation (3) is a result-effective variable for faithfully reproducing the intended reflection waveform (pages 6-7 of the specification).

Another difference is that the value d of the present claims as calculated using equation (2), namely, a semispherical model as pictured below. The present inventors found that calculation as a spherical structure (semisphere constituted of small flat planes) provides a result closer to the measured value, rather than a calculation as a flat plane. Equation (2) is an extension of equation (1) so that it becomes possible to apply the design process of the present invention to a spherical material.

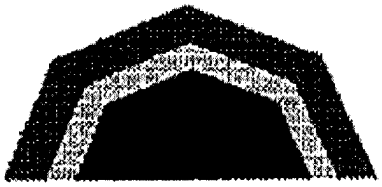


Fig. 2 Semispherical model

On the other hand, in EP '818, the value d is calculated using equation (1). Namely, Fresnel's equation. This is a model as shown below and is often disclosed in textbooks.

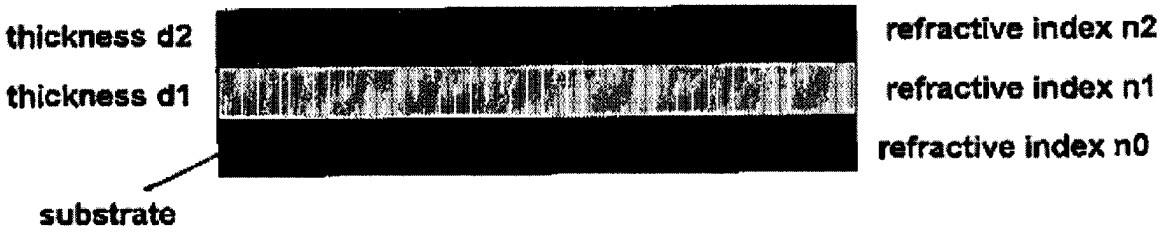


Fig. 1 Flat plate model

That is, if a material has a flat plate, it is possible to use only equation (1). However, if a material is spherical, especially if the size of the particle becomes small, it becomes difficult to apply equation (1) thereto.

In one aspect, the present inventors proposed equation (2) so as to apply the equation to the flat plate material. This is a unique aspect of the invention not disclosed or suggested by the prior art.

The present invention provides a process for designing an optically coherent multilayered film-coated powder of a desired color, by taking L^*_0, a^*_0 and b^*_0 calculated as values of the CIELAB color system from the reflectance curve as a reference, by comparing the desired color and the color obtained from the design of the interference film, and by executing a computer calculation for such a film thickness that the difference (ΔZ^*) becomes minimum and hues become closer.

For the Examiner's reference, the algorithm of the present invention is explained below and in reference to the accompanying flowchart.

1. Data to be prepared in advance (data already input in the computer):

(1) refractive index (having wavelength dependence) of substrate (such as Fe, Ni, Al, or Fe_3O_4) ;

(2) refractive index (having wavelength dependency) of film substance (such as TiO_2, SiO_2 or $A1_20_3$) .

2. Initial conditions:

(1) type of substrate;

(2) L*a*b* values of target color.

3. Calculation method (by computer, simplex method):

(1) to obtain reflectance curve data and to calculate L*a*b* values, based on the equations (1) and (2) described in the present invention;

(2) to change the combination of film substances, thicknesses of films and number of layers until the color difference and the hue reach a target range.

4. Output of calculation results:

(1) The calculation 3 (as above) outputs the film substance of each layer and the thickness thereof;

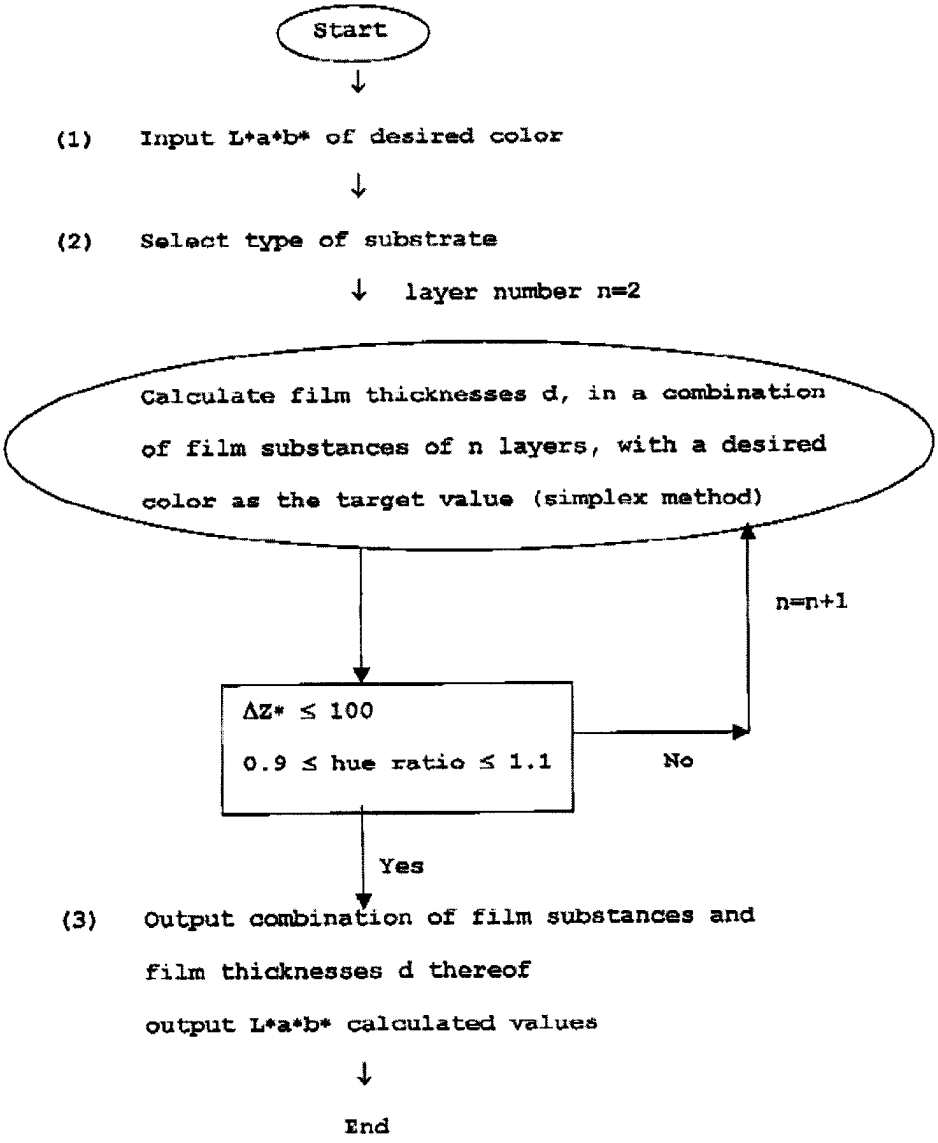
(2) The calculation 3 (as above) outputs the calculation results of L*a*b*.

5. Actual preparation of coated powder:

(1) Coating is executed so as to obtain the layer construction of 4 (1) (as above);

(2) The color of the obtained powder is measured, and the obtained L*a*b* values and the desired color are compared.

The Examples of the present specification are described in the order of 2 to 5 above.



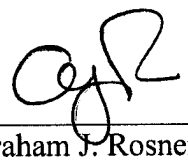
For the above reasons, it is respectfully submitted that the present claims are patentable over EP '818, and withdrawal of the foregoing rejection is respectfully requested.

Withdrawal of all rejections and allowance of claims 1-, 3-6 and 8-10 is earnestly solicited.

In the event that the Examiner believes that it may be helpful to advance the prosecution of this application, the Examiner is invited to contact the undersigned at the local Washington, D.C. telephone number indicated below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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Date: March 3, 2008